

Code: 9A04801

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B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

CELLULAR & MOBILE COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain the operation of cellular systems.
(b) Explain about the mobile fading characteristics.
- 2 (a) Explain the C/I in an omnidirectional antenna system and derive it.
(b) What are the components considered in cellular systems? Explain it.
- 3 (a) Explain different methods used for reducing near end to far end interference.
(b) Write notes on diversity.
- 4 (a) Explain propagation over water or flat open area.
(b) Determine the phase difference between direct path and reflected path.
- 5 (a) What are directional antennas? Explain directional antennas for interference in detail.
(b) Explain about omnidirectional antennas.
- 6 Explain about:
(a) Channel sharing.
(b) Channel borrowing.
- 7 (a) What is forced handoff? Explain it.
(b) Explain the concept of delayed handoff.
- 8 (a) What are the difference between GSM and CDMA mobile phone?
(b) Explain the TDMA technique.

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Answer any FIVE questions
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- 1 (a) Explain the basic cellular system with neat diagram.
(b) Explain the items required for service quality in cellular mobile system.
- 2 (a) Explain the co-channel interference reduction factor and derive the formula for C/I.
(b) Define cell splitting. How does cell splitting affect the system design?
- 3 (a) Discuss in detail the various techniques to measure co-channel interference.
(b) Describe the effects of antenna parameters on the cell interferences.
- 4 (a) Explain the long distance propagation.
(b) Explain about foliage loss in detail.
- 5 (a) What is the use of broadband umbrella pattern antenna? Explain it.
(b) What are the antennas used at cell site? Explain them.
- 6 (a) Explain about non fixed channel assignment.
(b) Explain about cell sectorization.
- 7 (a) Explain how handoff is initiated.
(b) What are the different methods of delaying the handoff? Explain it.
- 8 (a) What are the major problems in AMPS system? How these can be overcome in GSM system?
(b) Explain the difference between TDMA and CDMA.

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- 1 Describe the principle of operation of cellular mobile system and explain the cellular concept with a neat diagram.
- 2 (a) Explain the designing of the Omni directional antenna under the practical case conditions for $K = 7$, $K = 9$ and $K = 12$ with all the suitable values and explaining each of them.
(b) Describe the changes that effect in cellular architecture aspects due to cell splitting.
- 3 (a) What is adjacent channel interference? How can it be minimized?
(b) Explain how co-channel interference is measured in real time mobile trans receiver.
- 4 (a) Explain point to point model and mention the types of point to point model and mention the merits.
(b) Write the notes on cell site antenna height.
- 5 Explain about:
(a) Omni directional antennas.
(b) High gain antennas.
- 6 (a) Discuss the concept of frequency management concern to the numbering the channels and grouping into the subset.
(b) Explain the different channel assignment algorithms in detail.
- 7 (a) Why handoff is necessary for cellular system? Determine the two types of handoffs based on signal strength and C/I ratio.
(b) Define the dropped call rate. How dropped calls are considered?
- 8 Explain in detail GSM architecture.

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Answer any FIVE questions
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- 1 Explain in detail the uniqueness of mobile radio environment.
- 2 (a) Explain the importance of $N = i^2 + ij + j^2$.
(b) Explain the concepts of frequency reuse channels and frequency reuse distance.
- 3 (a) Distinguish between co-channel interference and non co-channel interference.
(b) Discuss the diversity schemes for interference reductions at both mobile unit and cell site.
- 4 (a) State the major factors causing propagation path loss.
(b) How is location of cell site and mobile unit influenced by foliage loss?
- 5 (a) Explain space diversity antenna in detail.
(b) Explain mobile high gain antennas in detail.
- 6 (a) Explain how set-up channels act as control channels in a cellular system.
(b) On what basis channels are assigned in an overlapped cell based system.
- 7 (a) How queuing is importance for the handoff procedure?
(b) Explain how to calculate the number of handoffs per call.
- 8 (a) Explain GSM services and features.
(b) Write the various parameters on which the capacity of CDMA depends. Explain it.
